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# Distributivity for a monad and a comonad

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## Abstract

We give a systematic treatment of distributivity for a monad and a comonad as arises in incorporating category theoretic accounts of operational and denotational semantics, and in giving an intensional denotational semantics. We do this axiomatically, in terms of a monad and a comonad in a 2-category, giving accounts of the Eilenberg-Moore and Kleisli constructions. We analyse the eight possible relationships, deducing that two pairs are isomorphic, but that the other pairs are all distinct. We develop those 2-categorical definitions necessary to support this analysis.

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